



March 8, 2016

Update on Beach Erosion Report

Division of Coastal Management



North Carolina's Coast

- 320 miles of ocean beaches
- 12,000+ miles of estuarine shoreline
- 2 million+ acres of sounds, creeks, and marshes
- 12 million annual visitors
- Coastal tourism generates ~ \$3 billion in annual revenue and directly supports ~15,000 jobs

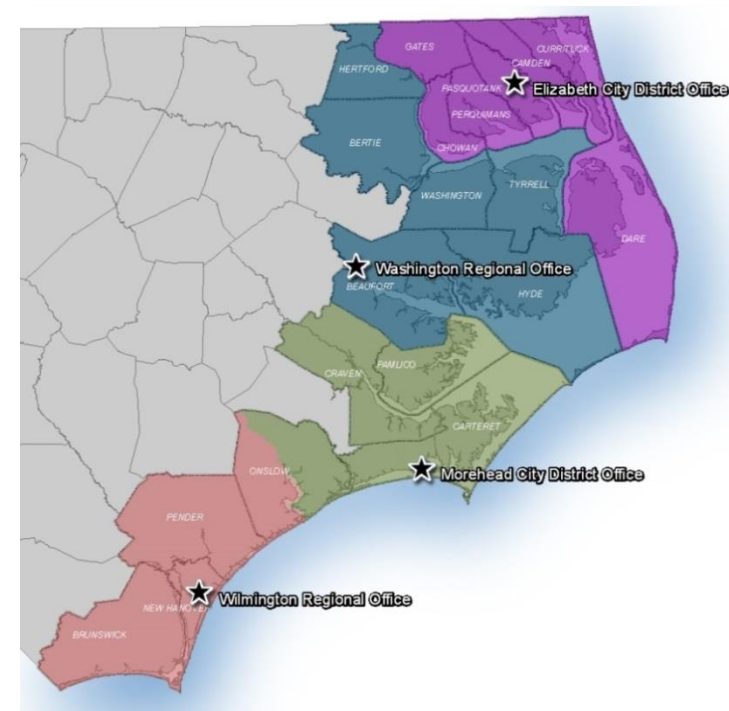
NC Coastal Area Management Act (1974)



- **Balances competing coastal pressures** through development permitting and creation of a Coastal Resources Commission
- Addresses coastal growth and related issues through **local/state partnership**
- Conserves undeveloped land for education and research through a **Coastal Reserve Program**
- **Enhances public access** to beaches and coastal waters through grants to local governments

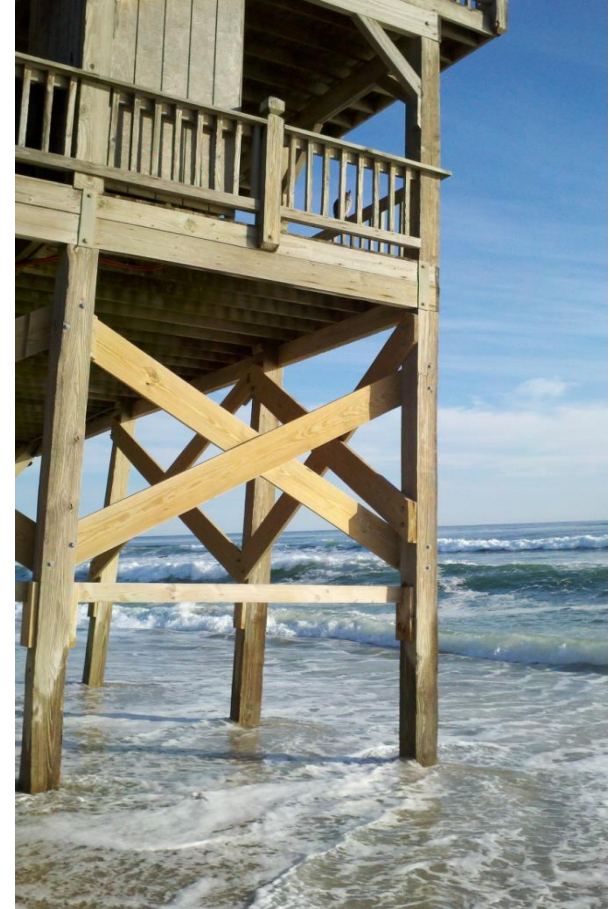
DCM Overview

- **Regulatory Program**
 - 4 District Offices; Local Permitting Officers
- **Policy and Planning Program**
 - Policy development w/ CRC
 - CAMA Land Use Planning
 - Waterfront Access Grants
 - Clean Marina Program
- **Coastal Reserve Program**
 - 10 Coastal Reserves
 - Focus on research and education



CRC's Ocean Hazard Areas

- **DCM jurisdiction includes:**
 - *Ocean Erovable Areas*
 - *Inlet Hazard Areas*
- **Erosion rate-based setbacks** based on size of structures
- **Ban on most permanent erosion control structures (since 1985)**
- **Rules governing beach and inlet projects**



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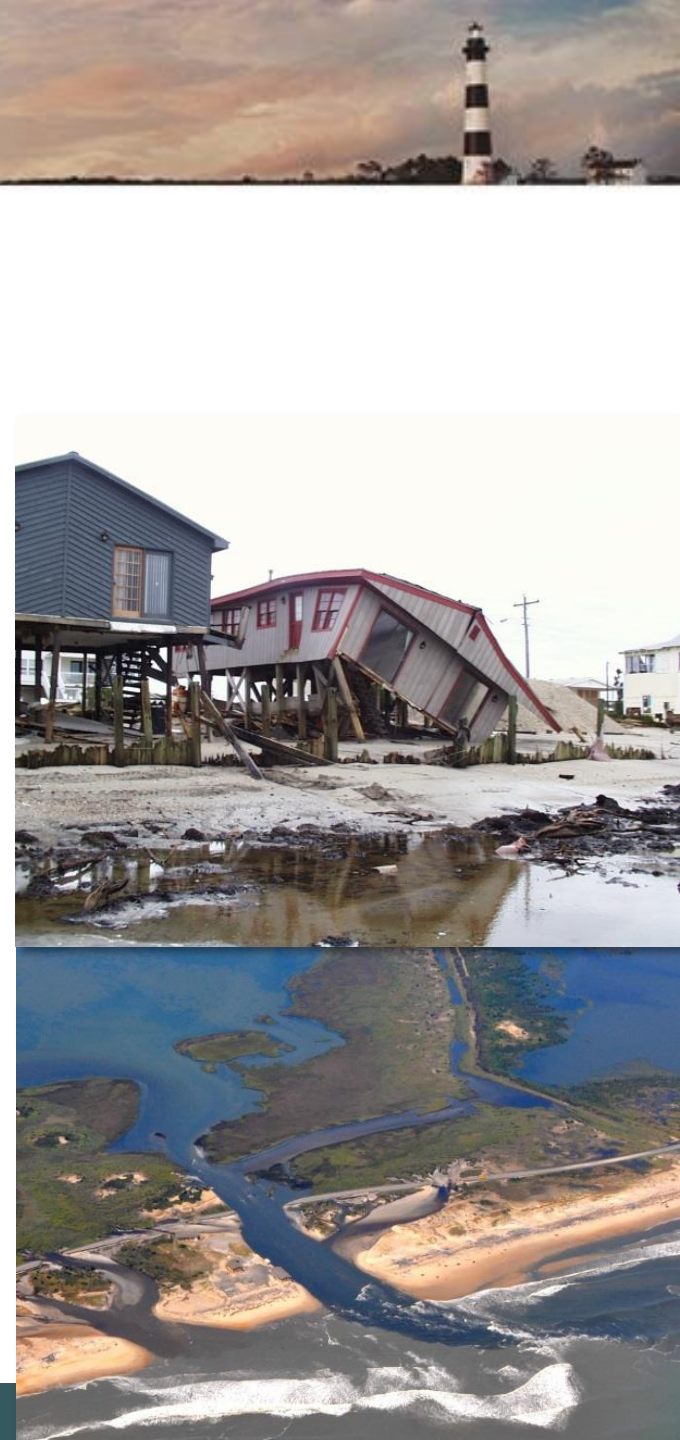


Required the Division of Coastal Management to “*study and develop a proposed strategy for preventing, mitigating, and remediating the effects of beach erosion.*”

Coastal Storms

- **Hurricanes of the 1990's**
 - *Bertha, Fran, Bonnie, Dennis, Floyd*
- **Hurricane Floyd (1999)**
 - 9-10 ft. storm surge & heavy rains
 - >\$6B economic losses
 - Up to 11,000 homes destroyed
- **Hurricane Isabel (2003)**
 - \$450M economic losses in NC
 - 2000' wide inlet on Hatteras Island

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Beach Erosion: Chronic vs. Storms

- Chronic, **long-term erosion** caused by changes in sand supply and relative sea level
 - Long-Term Average Erosion Rates (LTER) used to measure building setbacks
 - 2/3 beach stations show long-term erosion
- **Storm-induced erosion** resulting from hurricanes, nor'easters can be dramatic



Beach Erosion



Constructed on Lea-Hutaff Island in 1990, this private home sat 500 feet from the ocean

The same house sat at the ocean's edge at low tide until finally being destroyed by a storm in 2015

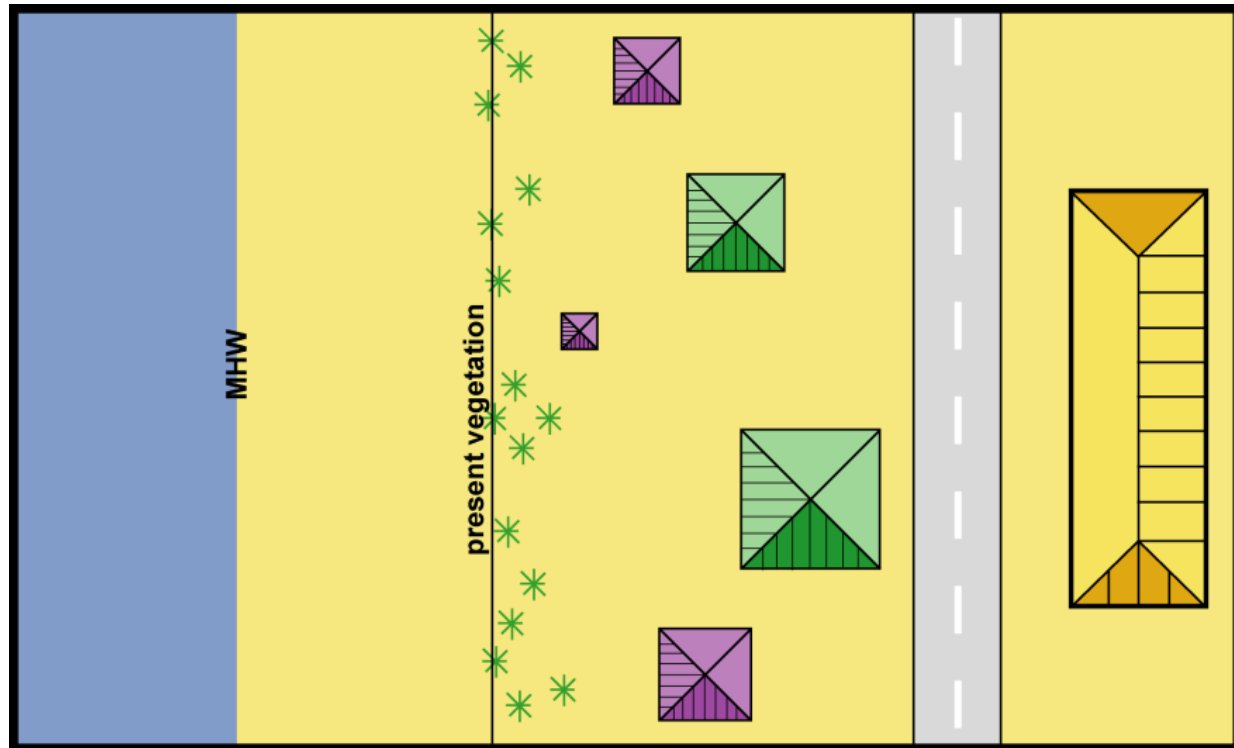


Graduated Construction Setbacks



- **Graduated, erosion-based setbacks based on size of structures and local long-term erosion rates**

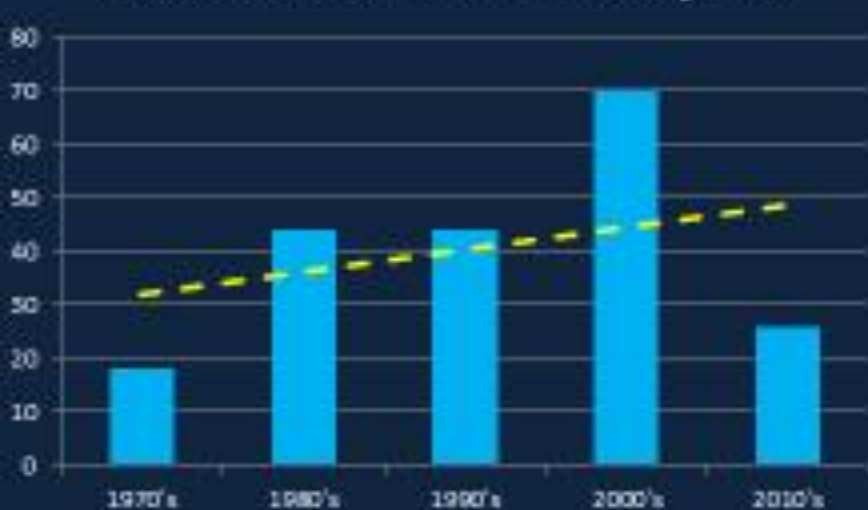
- Min. Erosion = 2 ft./year
- < 5000 sf... x30
- 5-10K sf... x60
- 10-20K sf.. x65
- 20-40K sf.. x70
- 40-60K sf.. x75
- 60-80K sf.. x80
- 80-100Ksf.. x85
- Over 100K.. x90



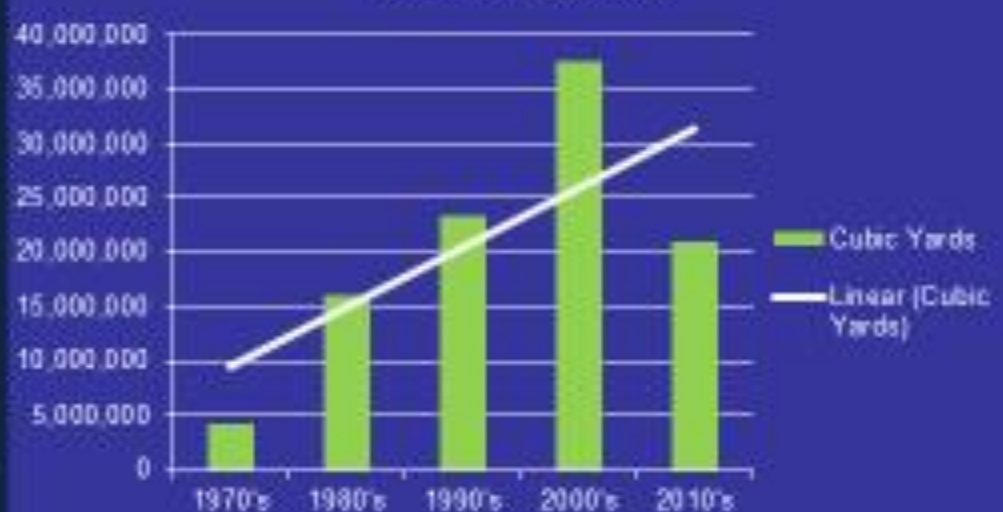
Increasing Beach Nourishment



Number of Nourishment Projects



Cubic Yards



Sandbags: Temporary Erosion Control



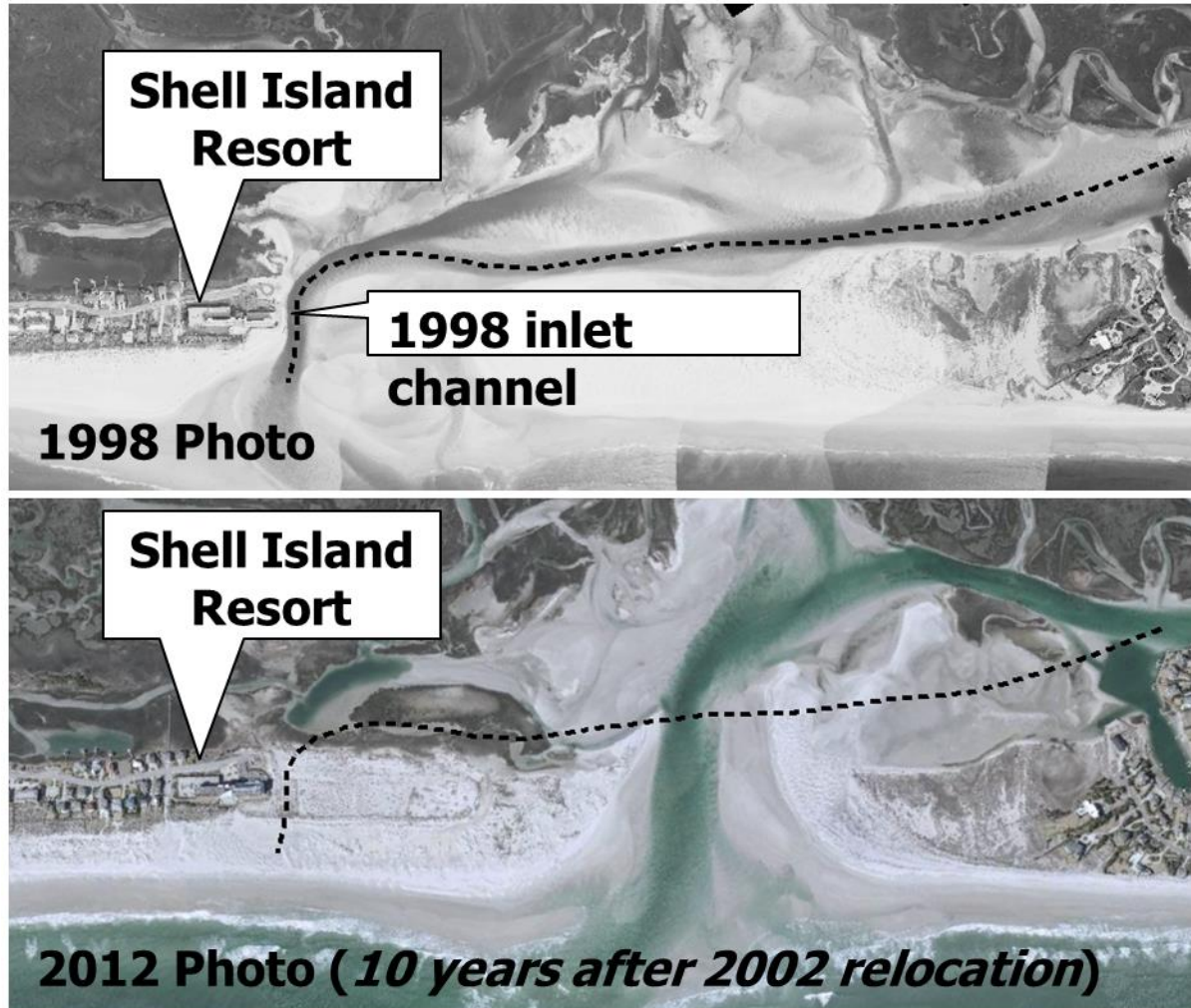
- **283 sandbag structures** on N.C. beaches / **7 miles**
- Prior enforcement issues led to rule amendments
 - 8-year time limit (if pursuing beach fill or other option)
 - Removal of one-time-per-property restriction

| Mapped (1996 – 2015) | Count |
|--------------------------------|------------|
| Total Inventory | 349 |
| Covered | 49 |
| Removed | 56 |
| Washed Out | 10 |
| Structures on the Beach | 283 |



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Inlet Relocation Projects



Mason Inlet

- Separates Wrightsville Beach & Figure Eight Island
- Project began in 2002
- Maintained every 3-5 years



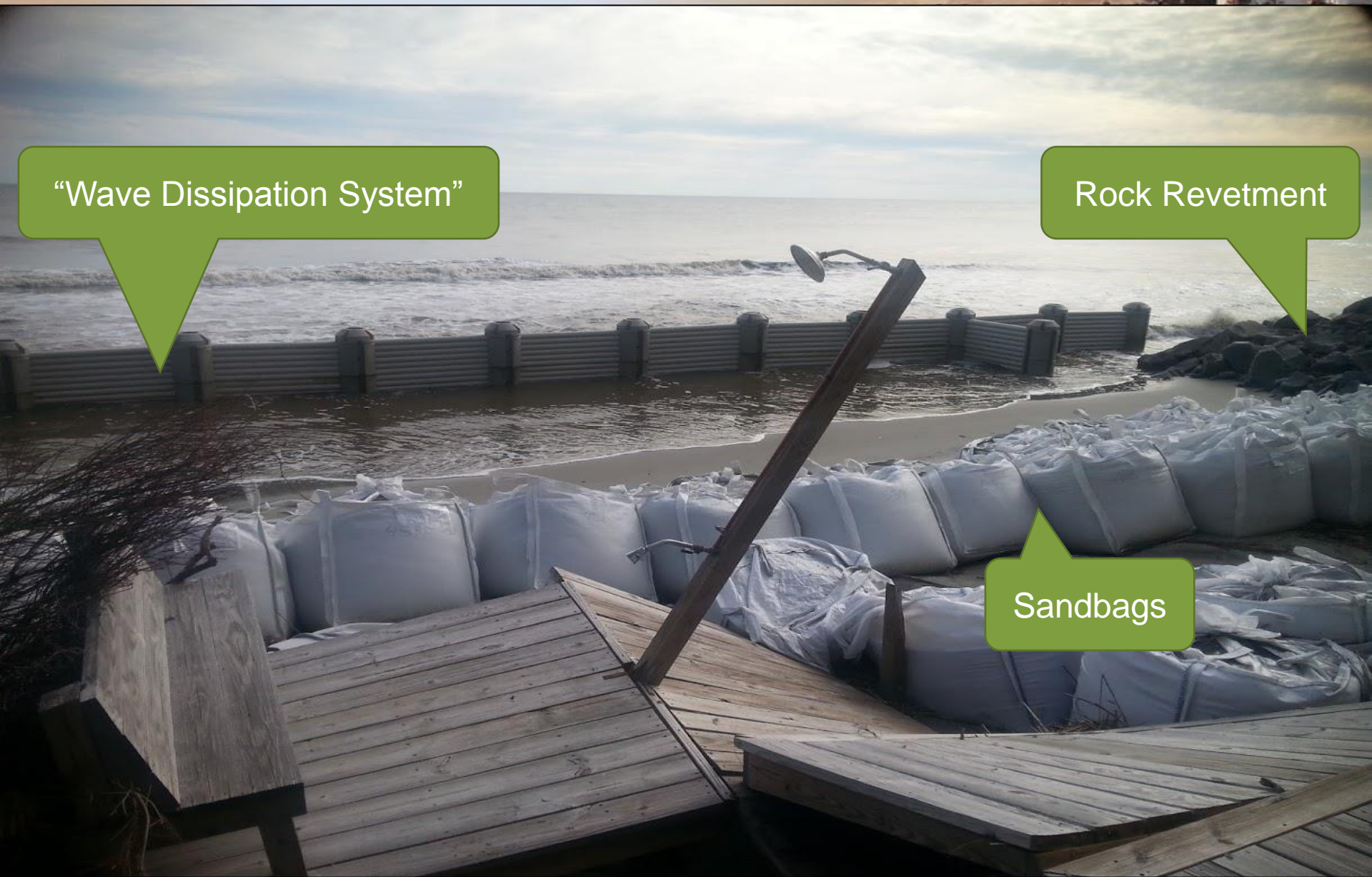
Terminal Groins

- **Up to 6 terminal groins now allowed** in N.C. inlets by S.L. 2011-387 and 2015-241
- **VBHI received first CAMA permit** for a terminal groin – construction completed Fall, 2015
- **Figure 8 Island, Holden Beach & Ocean Isle Beach** have expressed interest and are at different stages in permitting process

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“Innovative” Erosion Control: Isle of Palms, S.C.



“Wave Dissipation System”

Rock Revetment

Sandbags

Historic Efforts to Address Beach Erosion:

- **1979 to Present – CRC and DCM**
 - Measuring beach shoreline change rates for nearly 40 years
- **1984 – N.C. CRC's Outer Banks Task Force**
 - Recommendations focused on balancing protection of public trust and erosion control
- **1997 – N.C. Division of Emergency Management**
 - Recommendations based on lessons learned during aftermath of Hurricane Fran
- **N.C. General Assembly**
 - **1997/1999** – Coastal Beach Movement, Beach Nourishment, and Storm Mitigation Study
 - **2011** – N.C. Beach and Inlet Management Plan
 - **2015** – BIMP Update



DCM Recommendations & Strategies

- **Routine monitoring and analyses** to better understand sediment budgets (sediment sources, littoral transport)
- Encourage local/regional **beach management plans**
- **Streamline permitting** processes
- Continue to **employ construction setbacks**
- Establish **predictable funding sources** for beach & inlet projects
- **Beneficially use** beach-quality dredged material
- **Dedicated state agency staff** for technical assistance in support of beach and inlet mgmt.



Public Comments:

• **Monitoring & Research Needs**

- Comprehensive understanding of regional and sub-regional sediment budgets

• **Funding and Management Needs & Concerns**

- The State should consider dedicated funding source for locally initiated projects
- Support regional management approaches (Carteret County Model)
- Support beneficial use of dredged material

• **Regulatory**

- Endorse beach nourishment as the primary mitigation alternative
- Streamline permitting
- Expand dredging window



North Carolina Division of Coastal Management

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